

Caneja, Elizabeth

From: Joe Gilio <jlgilio@mac.com>
Sent: Tuesday, February 9, 2021 12:25 PM
To: ASRWells
Cc: Thurlow-Lippisch, Jacqui
Subject: Questions on ASR's : volume, water quality, HAB reduction?

[Please remember, this is an external email]

Dear SFWMD staff,

My concerns with ASR's are several:

#1. The water volume storage max's out at approximately 80 units totals ~0.4 maft. At that storage volume, then compared to the total water inflow into Lake Okeechobee over the past 4 decades of about 2.1 maf/yr. this temporary storage is about 20% annual reduction inflow into the lake. This assumes 100% operation of the wells with any Murphy law glitches [ie, this storage vol. is maximum]. How does that temporary storage volume compare to Lake Okeechobee's water storage ability say from 15.5 to 16.5 ft NGVD? The completion of the USACE vertical clay/cement hardening of the HDD should permit such an increase without increasing dike breakage beyond an engineering acceptable level. By my calculations, hysographic analysis adds 0.45 maft storage almost equivalent to ASR well construction, utilization and maintenance. Hence what are the cost benefits, the ecological benefits and the long-term water use benefits of ASR wells. As you are well aware, the stored volume must eventually be returned back to the lake. ASR's are temporary storage tanks.

2. What % of water quality improvements to lake Okeechobee are expected to result from ASR wells? Assuming the TP level of ASR storage/ recovery and treatment results in decreasing the TP from incoming ~ 150 ppb TP to 50 ppb TP and the temporary volume inflow is ~ 20%, then the % reduction to the total annual inflow of ~ 450 mt/yr. is reduced to ~ 415 mt/yr. Is this 35 mt TP reduction cost effective compared to the sum total of TP reduction in CERP and Governor mandated projects worth it? Does this reduction decrease the TP in the water column of the lake? Will the ASR project produce any known reduction in future annual HAB's in the lake?

3. Phosphorus [P] and Arsenic [As] are chemical "cousins". They occur together in the periodic chart and in nature. Natural P deposits in Mullbury and Bartow pebbles range from 28-31 ppm As in TP concentrations ~ 30% wt/wt. The recovery of ASR stored water contains both As levels and possibly other non-specified chemicals added naturally or artificially in the storage and recovery process. Initial experiments on this recovered waters showed negative effects on the major zooplanktonic species of Lake Okeechobee, Daphnia sp. This zooplankter is the major basis for the third trophic tier for small fish. The USACE has indicated that the As problem in the recovered water has been solved. As a limnologist, I would like to know more on the solution and its reliability with continued ASR well usage.

Sincerely,

Joseph L. Gilio

Ref. Tremearne and Jacob, 1941 Arsenic in Natural Phosphate and Phosphate fertilizers.USDA